



US005515081A

United States Patent [19][11] **Patent Number:** **5,515,081****Vasilik**[45] **Date of Patent:** **May 7, 1996**

[54] **SYSTEM AND METHODS FOR IMPROVED STORAGE AND PROCESSING OF BITMAP IMAGES**

5,245,323 9/1993 Ichijo 345/185
5,367,318 11/1994 Beaudin et al. 345/185

[75] Inventor: **Kenneth E. Vasilik**, Scotts Valley, Calif.

Primary Examiner—Richard Hjerpe

Assistant Examiner—Doon Chow

Attorney, Agent, or Firm—John A. Smart

[73] Assignee: **Borland International, Inc.**, Scotts Valley, Calif.

[57] **ABSTRACT**

[21] Appl. No.: **160,529**

[22] Filed: **Nov. 30, 1993**

[51] Int. Cl.⁶ **G09G 1/02**

[52] U.S. Cl. **345/189; 345/192; 345/128; 345/141**

[58] **Field of Search** 345/189, 185, 345/190, 191, 187, 201, 141, 143, 128, 192; 395/164

System and methods are described for storing and processing multiple bitmap images, such as those commonly employed in graphical user interfaces (GUIs), within a single "master" bitmap. Within a master bitmap, each image is bound by "corner brackets," each of which comprises a group of pixels which may be identified separately. Each image within a given master bitmap may be identified and processed as a separate image. Methods are described, for instance, for determining size, position, and identity of each image within a multi-image bitmap. Size is computed from the distance between the brackets surrounding an image; position may be computed relative to the position of the surrounding brackets. For identification, each image is provided with a unique ID or identifier, such as a number, embedded within the master bitmap itself. A method of the present invention for decoding an image from a master bitmap is also presented.

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,642,621 2/1987 Nemoto et al. 345/118
4,761,643 8/1988 Fujiwara 345/189
5,091,720 2/1992 Wood 345/185

30 Claims, 18 Drawing Sheets

